U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: PILOT CERTIFICATES: AIRCRAFT TYPE RATINGS **Date: 2/21/91** **Initiated by: AFS-840** **AC No: 61-89D** **Change:**

1. PURPOSE. This Advisory Circular (AC) provides a generic type rating curriculum that may serve as a basis for schools to develop a training course outline (TCO) to meet the type rating training requirements of the Federal Aviation Regulations (FAR) Parts 61 and 141. This AC also provides pilot certificate designations adopted by the Federal Aviation Administration (FAA) for aircraft type ratings and standardizes aircraft designations placed on pilot certificates to show pilot type rating qualifications.

2. CANCELLATION. AC 61-89C, Pilot Certificates: Aircraft Type Ratings, dated March 6, 1990.

3. BACKGROUND. Pilot schools, pilot examiners, and the general aviation public have a continuing need for a type rating reference such as that provided by this circular. This AC provides a guideline for schools that offer type rating training. Unlike programs operating under FAR Parts 121, 135, and 141, or training centers operating under exemption, schools that only offer type rating training are not required to submit training programs to the FAA for approval.

4. INTRODUCTION.

a. The content of this curriculum is based on the maneuvers and procedures of FAR Part 61, Appendix A, "Practical Test Requirements for Airplane Airline Transport Pilot Certificates and Associated Class and Type Ratings," and on the corresponding Practical Test Standards (PTS). The format of this curriculum is based on FAA Order 8400.10, Air Transportation Operations Inspector's Handbook, which provides detailed information on TCO's for FAR Part 121 and Part 135 operators. This order is available from the FAA Document Inspection Facility, APA-230. If used, this generic curriculum should be adapted to include specific data and characteristics of the aircraft for which the type rating is being issued.

b. Additional training requirements for a pilot to act as pilot in command of a particular aircraft may be included in the type rating training. For example, most airplanes that require type ratings have more than 200 horsepower (or the equivalent thrust), pressurization, and service ceilings and/or maximum operating altitudes above 25,000 feet mean sea level. Pilots would therefore be required to receive both a high performance endorsement and a high altitude endorsement in their logbook or training record before acting as pilot in command of those airplanes. If they do not have the endorsements when they begin training for the type rating, the training for those endorsements may be included in the type rating curriculum if the airplane for which the type rating is required fits the appropriate description.

However, separate logbook endorsements must be issued for the type rating, high performance, and/or high altitude training, as appropriate. If high performance and high altitude training is conducted in conjunction with type rating training, the high performance and high altitude training should include specific operational aspects of the airplane. For example, the high altitude training recommended in AC 61-107, Operations of Aircraft at Altitudes Above 25,000 feet MSL and/or MACH Numbers (Mmo) Greater Than .75, should include the airplane's particular systems and procedures for operating at high altitudes (such as the pressurization system and the specific decompression and emergency descent procedures described in the airplane flight manual).

c. Although the requirements of Section 61.63(d)(4)(i) of FAR Part 61 apply to airplanes only, the generic curriculum in this AC may be used for any aircraft that requires a type rating. Regardless of whether this generic curriculum is used, it is the responsibility of each school to update its curriculum as necessary and to adapt that curriculum to the specific aircraft, flight environment, and type of flight operations that will be conducted. The curriculum should be included in a TCO or syllabus, which should contain detailed information on the type of operation, the training environment, and completion standards. The instruction provided in this curriculum is designed as initial equipment training and consists of approximately 50 hours of ground instruction, 15 hours of simulator or training device instruction, and four flights in the airplane (15 hours, including ground time). The number of hours are suggestions only and should be modified as necessary.

d. Users of this AC should be aware that qualification of criteria exists in the most current issues of AC 120-40, Airplane Simulator and Visual System Evaluation, and AC 120-45, Advanced Training Devices (Airplane Only) Evaluation and Qualification, and FAR Part 121, Appendix H, Advanced Simulation Plan, for flight simulators and flight training devices.

e. The duration and specific content of each lesson will depend on the airplane for which the type rating is sought and on the type of the operation. For example, if the airplane is equipped with a simple autopilot, the instruction on autoflight systems may not take more than half an hour and can be combined with another lesson. However, the pilot may need to undergo more than 2 hours of instruction before fully understanding the operation of some sophisticated autopilots. Examples of different types of operations that may affect the length of each lesson are visual flight rules (VFR) only vs. instruments flight rules (IFR) operations and single pilot vs. two pilot crews. The instructor should adjust the curriculum accordingly, ensuring that the applicable items contained in appendix 1 are covered.

f. Appendix 2 contains a revised list of aircraft type designations which are placed on pilot certificates.

g. Appendix 3 specifies the use of the limitation area on the airman certificate for operational restrictions associated with type ratings, e.g., N-B-25, VFR ONLY or center thrust limitations.

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APPENDIX 1. CONTENTS

APPENDIX 1. CONTENTS (CONTINUED)

GROUND INSTRUCTION. Acceptable completion standards for each lesson and examinations should be established by the school. Many schools use a pass/fail system, while others may prefer a minimum passing grade (70 or 80 percent) for written examinations.

STAGE 1 – GENERAL OPERATIONAL SUBJECTS

OBJECTIVE: The type rating applicant will clearly understand operational requirements that are specific to the airplane for which the type rating is required.

COMPLETION STANDARDS: The type rating applicant must be able to demonstrate knowledge and understanding of the subject matters in this stage by passing a written stage examination to acceptable standards.

Lesson #1 – Introduction to the Airplane and Operating Limitations (2 hours)

A. Objective: The applicant will become familiar with the airplane's history, background, operating limitations, and general characteristics.

B. Content:

1. Introduction and course overview.
2. General airplane information – Manufacturer, other models; year of production; airplane authorizations and specifications; equipment and furnishings; unique characteristics.
3. Operating limitations.
4. Airplane flight manual (AFM) – General layout, content, and use.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, an understanding of the lesson content.

Lesson #2 – Weight and Balance (2 hours)

A. Objective: The applicant will become familiar with the weight and balance limitations of the airplane and be able to ensure the aircraft is loaded properly.

B. Content:

1. Computations of center of gravity (CG) location for specified load conditions including adding, removing, or shifting weight.
2. Determining if the computed CG is within the forward, aft, and lateral (if applicable) limits for takeoff and landing.
3. Effects of fuel burn on CG.

C. Completion Standards: The type rating applicant must be able to demonstrate proficiency in using the airplane weight and balance charts to solve sample loading problems.

Lesson #3 - Adverse Weather Practices (2 hours).

A. Objective: The applicant will become familiar with the manufacturer's recommended practices for operating in adverse weather conditions.

B. Content (as applicable):

1. Operations in ice, slush, and snow.
2. Operations in turbulence.
3. Operations in heavy precipitation.
4. Low level windshear encounter.
   a. Takeoff under suspected windshear
   b. Suspected windshear approach
5. Thunderstorm avoidance.
6. Thunderstorm precautions.
7. Cold weather precautions.
8. Low visibility operations.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge of the manufacturer's recommended adverse weather practices.

Lesson #4 - Aerodynamics and Performance and Minimum Equipment List (3 hours)

A. Objective: The applicant will become familiar with the airplane's aerodynamic and performance characteristics and limitations and the Minimum Equipment List (MEL) for the aircraft.

B. Content (as applicable):

1. Review of fundamentals of aerodynamics.
2. Airflow - Airfoils; wing type; aerodynamic effect of spoilers, speed brakes, flaps, slats, and other configurations.
3. High speed aerodynamics/slow speed aerostability.
4. Recommended airspeeds during specific phases of flight.
5. Stall/spin characteristics and limitations.
6. Performance charts, tables, tabulated data, and other related AFM information - Accelerate-stop/accelerate-go distance; takeoff performance, with all engines and with engine(s) inoperative; climb performance, with all engines and with engine(s) inoperative; cruise performance; fuel consumption, range, and endurance; descent performance; and other performance data (appropriate to the aircraft).

7. Normal, abnormal, and emergency performance scenarios.
8. Meteorological and weight-limiting performance factors (such as temperature, pressure, contaminated runways, precipitation, climb/runway limits).
9. Inoperative equipment performance limiting factors (such as MEL or configuration deviation list (CDL), inoperative antiskid).
10. Special operational conditions (such as unpaved runways and high altitude airports).
11. Other information found in the approved AFM on the airplane's aerodynamics, performance, and limitations.

C. Completion Standards: The type rating applicant must be able to demonstrate use of the airplane's performance charts to determine aircraft performance and limitations during all flight regimes. He/she must also be familiar with a permitted inoperative component MEL as it affects aircraft operation.

Lesson #5 - Stage 1 Written Examination - The type rating applicant must be able to pass, to acceptable standards, the written examination on material covered during Stage 1.

STAGE 2 - AIRPLANE SYSTEMS AND COMPONENTS

OBJECTIVE: The type rating applicant will understand the airplane system components, limitations, relevant controls, actuators, annunciators, and procedures for various system configurations.

COMPLETION STANDARDS: The type rating applicant will have successfully completed Stage 2 when he/she can demonstrate knowledge of the airplane's systems and components by passing a written test to acceptable standards.

Lesson #6 - Fuel and Oil Systems (3 hours)

A. Objective: The applicant will become familiar with the fuel and oil systems of the airplane, including AFM normal operating procedures.

B. Content (as applicable):

1. Fuel system - Tank location(s) and venting systems; capacity; drains; pumps; distribution; fuel injectors or carburetors; fuel heat; controls; indicators; crossfeeding; transferring; fuel grade, color, and additives; fueling and defueling procedures; emergency substitutions; fuel jettison system,
2. Oil system - Capacity; grade; quantities; indicators.
3. AFM normal procedures, limitations, and operational considerations.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's fuel and oil systems.

Lesson #7 = Powerplant(s) (3 hours)

A. Objective: The applicant will become familiar with the components and operation of the airplane powerplant(

B. Content (as applicable):

1. Powerplant - Type and thrust/horsepower, controls and indicators; induction system; fuel injection/carburetion; exhaust and turbocharging; cooling; fire detection/protection; mounting points; turbine wheels; compressors; other applicable components (thrust reversers, engine synchronizer).
2. Propellers - Type; controls; allowable wear, feathering/unfeathering; autofeather negative torque sensing; synchronizing and synchrophasing.
3. Ignition system.
4. AFM normal operating procedures and limitations.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's powerplant structure and operation.

Lesson #8 = Electrical System (2 hours)

A. Objective: The applicant will understand the airplane's electrical power systems and operation.

B. Content (as applicable):

1. Fundamentals of electricity.
2. AC/DC power; battery/emergency bus; alternators; generators; fuses; circuit breakers and current limiters; controls; indicators; external power, Auxiliary Power Unit (APU).
3. Normal AFM operation and limitations of electrical power system units.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's electrical power systems and their normal operation.

Lesson #9 = Hydraulic System (2 hours)

A. Objective: The applicant will become familiar with the airplane's hydraulic system and its operation.

B. Content (as applicable&

1. Principles of hydraulics.
2. System construction features - Capacity; pumps; pressure; reservoirs; grade; regulators and accumulators.
3. Use of hydraulics in the airplane - Systems and subsystems.
4. Normal AFM operation and limitation of hydraulic system.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's hydraulic systems.

Lesson #10 - Landing Gear and Brakes (2 hours)

A. Objective: The applicant will understand and will be able to operate the airplane's landing gear and brake system.

B. Content (as applicable):

1. Landing gear system - Indicators; tires; nosewheel steering; skids; shocks.
2. Brakes - Components; operation.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the structure and operation of the airplane's landing gear and brake systems.

Lesson #11 - Pneumatics System (1 hour)

A. Objective: The applicant will understand and be able to operate the airplane's pneumatics system and operation.

B. Content (as applicable):

1. Principles of pneumatics.
2. Description of system elements - Engine-driven pumps; bleed-air sources, routing, venting, and controlling; pressure limiting devices.
3. AFM normal operating procedures.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's pneumatics system.

Lesson #12 - Environmental Systems (3 hours)

A. Objective: The applicant will understand the functioning and operation of the airplane's environmental systems.

B. Content (as applicable):

1. Heating; cooling; ventilation.
2. Air conditioning.
3. Pressurization – Components; controls; indicators; regulating devices; system operation; emergency pressurization.
4. AFM normal operating procedures.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's environmental systems.

Lesson #13 – Flight Controls (4 hours)

A. Objective: The applicant will understand and be able to operate the airplane's flight control systems and operation.

B. Content (as applicable):

1. Primary flight controls (yaw, pitch, and roll devices).
2. Secondary flight controls (leading/trailing edge devices, flaps, trim, spoilers, spoilerons, speed brakes, and damping mechanisms).
3. Associated devices such as stall or MACH overspeed warning devices.
4. Limitations.
5. AFM normal operating procedures.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's flight control systems and operations.

Lesson #14 – Ice and Rain Protection (2 hours)

A. Objective: The applicant will understand and be able to operate the airplane's ice protection systems.

B. Content (as applicable):

1. Ice detection.
2. Anti-ice/deice systems.
3. Limitations.
4. AFM normal operating procedures.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's ice protection systems.

Lesson #15 – Fire and Overheat Protection (2 hours)

A. Objective: The applicant will understand the structure and operation of the airplane's fire and overheat protection systems.

B. Content (as applicable):

1. Fire and overheat sensors, loops, modules, or other means of providing visual and/or aural indications of fire or overheat detection.
2. Automatic extinguishing systems.
3. Power sources necessary to provide detection of fire and overheat conditions in engines, APU, cargo bay/wheel well, cockpit, cabin, and/or lavatories.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's fire and overheat protection systems.

Lesson #16 – Flight Instruments (2 hours)

A. Objective: The applicant will become familiar with the location and operation of the airplane's flight instruments.

B. Content (as applicable):

1. Panel arrangement.
2. Pilot static system and instruments – Operation of the system, including drains, pilot heat, and alternate static sources; airspeed indicator bug settings, including markings; altimeter, vertical speed indicator.
3. Vacuum system and instruments – Operation of the system, including gauges and malfunction indicators; attitude indicator, heading indicator; turn and slip indicator.'
4. Electrically operated instruments – Turn and bank coordinator; attitude indicator; altimeter.
5. Magnetic compass – Errors in and use of magnetic compass system.
6. Air data computer.
7. Stall avoidance and warning systems.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's flight instrument systems and familiarization with the arrangement of those instruments on the panel.

Lesson #17 – Navigation Equipment and Display Systems (4 hours)

A. Objective: The applicant will understand and be able to operate the airplane's navigation equipment and display systems.

B. Content (as applicable):

1. Aircraft transponders, radio altimeters, electronic flight instrumentation system (EFIS), or computer-generated displays of aircraft position and navigation information.
2. Navigation receivers – VOR, NDB, RNAV, LORAN-C, OMEGA, DME, marker beacon.
3. Inertial systems (INS, IRS) – functional displays, fault indications, comparator systems.
4. Flight director.
5. Weather detection systems – Stormscope, radar
6. Traffic collision and avoidance system.
7. Flight management system.
8. Low altitude windshear system.

C. Completion Standards: The type rating applicant should be able to demonstrate, by oral testing and discussion, familiarity with and basic operation of the airplane's navigation equipment and display systems.

Lesson #18 – Autoflight Systems (2 hours)

A. Objective: The applicant will understand and be able to operate the airplane's autoflight system.

B. Content (as applicable): Autopilot/autothrottle – Interface with aircraft flight director and navigation systems, including automatic approach tracking, autoland, and automatic fuel or performance management systems.

C. Completion Standards: The type rating applicant should be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's autoflight system.

Lesson #19 – Communications Equipment (1 hour)

A. Objective: The applicant will become familiar with and be able to operate the airplane's communications equipment.

B. Content (as applicable): VHF/HF radios; audio panels; in-flight interphone and passenger address systems; voice recorder, ARINC communications addressing and reporting system.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's communications systems and equipment.

Lesson #20 – Miscellaneous and Review (2 hours)

A. Objective: The applicant will become familiar with the airplane's systems and components which have been covered and review Stage 2.

B. Content (as applicable):

1. All other systems included in the approved AFM (e.g., stability augmentation devices, squat switch systems, drag chute).
2. Review any problem areas from Stage 2 in preparation for the stage examination.

C. Completion Standards: The type rating applicant must be able to demonstrate knowledge and understanding of the material covered during this stage to pass the written Stage 2 examination to acceptable standards.

Lesson #21 – Stage 2 Written Examination – The type rating applicant must be able to pass, to acceptable standards, the written examination on material covered during Stage 2.

STAGE 3 – AIRCRAFT-SPECIFIC EMERGENCY TRAINING

OBJECTIVE: The aircraft type rating applicant will become familiar with emergency and abnormal procedures associated with aircraft systems, structural design, and operational characteristics.

COMPLETION STANDARDS: The type rating applicant will have successfully completed Stage 3 when he/she can demonstrate knowledge and understanding of the emergency and abnormal procedures specified in the approved AFM by passing a written test to acceptable standards.

Lesson #22 – Emergency Equipment (2 hours)

A. Objective: The applicant will become familiar with the location and use of emergency equipment.

B. Content (as applicable):

1. Survival gear.
2. Oxygen equipment and supply.
3. Emergency exits and escape slides.
4. Fire extinguisher(s).
5. Life vests and other personal flotation device(s).
6. Other emergency equipment.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge of the location and use of the airplane's emergency equipment.

Lesson #23 = Abnormal and Emergency Procedures (4 hours)

A. Objective: The applicant will become familiar with the abnormal and emergency procedures in the AFM.

B. Content (as applicable&

1. Abnormal starting procedures, including knowledge of external power source usage, abnormal starting limitations, and the proper corrective action required in the event of a malfunction.
2. Powerplant failure under circumstances, including but not limited to, prior to rotation, during climbout, during cruise flight, in steep bank turns, and in instrument meteorological conditions.
3. Rapid decompression and emergency descent.
4. Ditching and evacuation procedures.
5. Electrical failure.
6. Failure of navigation or communications equipment.
7. Hydraulic failure.
8. Landing gear and flap systems failure or malfunction.
9. In-flight fire.
10. Smoke control and removal.
11. Ice and rain protection.
12. Anti-icing or deicing system failure or malfunction.

C. Completion Standards: The type rating applicant must be able to demonstrate, by oral testing and discussion, knowledge and understanding of the airplane's abnormal and emergency procedures.

Lesson #24 = Stage 3 Written Exam = The type rating applicant must be able to pass, to acceptable standards, the written examination on material covered during Stage 3.

REVIEW AND FINAL EXAMINATION

Lesson #25 = Review (3 hours)

A. Objective: The applicant will be prepared to accomplish successfully the final examination.

B. Content: All material covered during Stages 1-3.

C. Completion Standards: The type rating applicant must be able to demonstrate, to acceptable standards, knowledge and understanding of the material covered during ground training that is applicable to the airplane for which a type rating is sought.

Lesson #26 - Final Examination

STAGE 4 - SYSTEMS INTEGRATION TRAINING

OBJECTIVE: The aircraft type rating applicant will be able to operate the simulator or training device used and will understand the interrelation between the airplane's systems and normal, abnormal, and emergency procedures.

COMPLETION STANDARDS: The type rating applicant will have successfully completed Stage 4 when he/she can demonstrate proficiency in the airplane by performing the maneuvers and procedures of FAR Part 61, Appendix A, to PTS standards on the simulator/training device portion of the practical test.

Lesson #27 - Cockpit Familiarization and Use of Checklists (2 hours)

A. Objective: The applicant will become familiar with the cockpit layout, checklists, and normal operating procedures and will be able to fly the aircraft, maintaining attitude and orientation.

B. Content:

1. Preflight discussion.
2. Introduction - Cockpit familiarization.
   a. Airplane systems operation and location of systems indicators, gauges, and warning devices.
   b. Activation of airplane system controls and switches.
   c. Use of checklists - Safety checks, cockpit preparation, checklist sequence.
3. Flight.
   a. "Normal starting procedures.
   b. Pretakeoff checks including powerplant checks, as appropriate to the airplane type.
   c. Normal or crosswind takeoffs - Knowledge of airspeeds, configurations, and emergency procedures recommended by the manufacturer for existing conditions. Following takeoff, performance of required pitch changes, gear and flap retractions, power adjustments, and other required pilot-related activities at the required airspeed/V-speed within the tolerances established in the AFM.
   d. Airspeed/V-speed control.
   e. Straight and level cruise flight.
   f. Climbs.
   g. Descents.
   h. Level, climbing, and descending turns.
   i. In-flight pressurization control.

j. Approach to landing and landings.
(1) Appropriate configurations.
(2) Normal or crosswind landings.

4. Postflight critique and preview of next lesson.

C. Completion Standards: At the completion of this lesson, the type rating applicant should be able to demonstrate familiarity with the airplane checklists and normal operating procedures.

Lesson #28 - Flight Maneuvers and Display Systems (2 hours)

A. Objective: The applicant will continue cockpit orientation and will review basic in-flight maneuvers and ILS approaches (if applicable).

B. Content (as applicable):

1. Preflight discussion.
2. Introduction - Display systems operation (weather radar and other EFIS displays).
3. Flight.
   a. Review of previous lesson.
   b. Normal takeoffs.
   c. Slow flight.
   d. Approach to stalls. For the purpose of this maneuver, the required approach to a stall is reached when there is a perceptible buffet or other response (stall warning or stick shaker, depending on the airplane devices) to the initial stall entry.
      (1) Takeoff configuration.
      (2) Clean configuration.
      (3) Landing configuration.
   e. Steep turns.
   f. Unusual attitudes.
   g. Normal ILS approaches (coupled and manual).*

4. Postflight critique and preview of next lesson.

C. Completion Standards: The type rating applicant must be able to demonstrate competency in performing the maneuvers and procedures contained in this lesson to levels consistent with the ITS.

Notes indicated by an asterisk (*) are instrument procedures that apply only to type ratings that are not restricted to VFR.

Lesson #29 – Flight Operations and Use of Autoflight Systems (3 hours)

A. Objective: The applicant will review instrument procedures (if applicable) and further develop his/her skills in conducting normal flight operations.

B. Content (as applicable):

1. Preflight discussion.
2. Introduction – Autoflight operation (autopilot, flight director, normal and abnormal indications and annunciators).
3. Plight.
   a. Review of previous lesson.
   b. Area departure and area arrival.
   c. Adherence to simulated air traffic control (ATC) clearances and to airspeed restrictions and adjustments required by regulations or the AFM.
   d. Use of autoflight system.
   e. Performance of checklist items appropriate to the area of arrival.
   f. Establishment, where appropriate, of a rate of descent consistent with the aircraft operating characteristics and safety.
   g. Holding, including entering, maintaining, and leaving holding patterns.*
   h. Instrument approaches.*
      (1) Precision approaches.
      (2) Nonprecision approaches, including circling approaches to the authorized minimum circling approach altitude.
      (3) Missed approaches from both precision and nonprecision approaches.
4. Postflight critique and preview of next lesson.

C. Completion Standards: The type rating applicant must be able to demonstrate competency in performing the maneuvers and procedures contained in this lesson to levels consistent with the ITS.

Lesson #30 – Emergency Procedures (2 hours)

A. Objective: The applicant will practice the emergency procedures recommended in the approved AFM. He/She will demonstrate proper knowledge of the flight characteristics and controllability associated with maneuvering with powerplant inoperative as appropriate to the airplane, including control of airspeed, configuration, direction, altitude, and attitude.

Note: Items indicated by an asterisk (*) are instrument procedures that apply only to type ratings that are not restricted to VFR.

B. Content (as applicable):

1. Preflight discussion.
2. Introduction.
3. Plight.
   a. Review of previous lesson.
   b. Emergency procedures checklist familiarization.
   c. Start malfunctions.
   d. Instrument take-off (simulated IMC at 100 feet).*
   e. Powerplant failure(s) in flight.
   f. In-flight fire.
   g. Rapid decompression emergency procedures.
   h. ILS approach with a simulated failure of one powerplant. The failure should occur before initiating the final approach course and must continue to touchdown or through the missed approach procedure.*

4. Postflight critique and preview of next lesson.

C. Completion Standards: The type rating applicant must be able to display, through competent performance and discussion, complete understanding of emergency and abnormal procedures as recommended by the manufacturer in the AFM.

Lesson #31 - Normal/Abnormal Flight Operations Review; Use of Navigation Systems (2 hours)

A. Objective: The applicant will further develop skills in normal flight operations and in abnormal flight situations with selected system malfunctions and gain skill in operating the airplane's navigation systems.

B. Content (as applicable):

1. Preflight discussion.
2. Introduction - Navigation systems
   a. Preflight and operation of applicable receivers.
   b. Onboard navigation systems.
   c. Plight plan information input and retrieval.

Note: Items indicated by an asterisk (*) are instrument procedures that apply only to type ratings that are not restricted to VFR.

3. Flight.
   a. Review of previous lesson.
   b. Cold weather operation.
   c. Aborted takeoff.
   d. Climb to and cruise at high altitude, both with and without autopilot.
   e. Use of navigation systems.
   f. Ice and rain protection system operation and malfunction procedures.
   g. Fuel systems malfunction.
   h. Engine(s) inoperative landing from an ILS.*
   i. Engine(s) inoperative nonprecision approach, circle to land.*

4. Postflight critique and preview of next lesson.

C. Completion Standards: The type rating applicant must be able to display, through performance and discussion, complete understanding of the airplane's navigation systems and of emergency and abnormal procedures as recommended by the manufacturer.

Lesson #32 – Normal/Abnormal Flight Operations (2 hours)

A. Objective: The applicant will further develop the type rating applicant's skills in normal and abnormal flight operations.

B. Content (as applicable):

1. Preflight discussion.
2. Flight.
   a. Review of previous lesson.
   b. Hot weather operation.
   c. Takeoff with engine failure after V_1 and before V_2.
   d. Inadvertent overspeed recovery procedures.
   e. Turbulence penetration.
   f. Hydraulic system malfunction.
   g. Flight control malfunctions.
   h. Emergency gear extension.
   i. No flap approach and landing.
   j. Precision and nonprecision instrument approaches (normal and engine(s) inoperative).*

4. Postflight critique and preview of next lesson.

Note: Items indicated by an asterisk (*) are instrument procedures that apply only to type ratings that are not restricted to VFR.

C. Completion Standards: The type rating applicant must be able to demonstrate, through performance and discussion, understanding of and proficiency in the aircraft's normal, abnormal, and emergency procedures to PTS standards.

Lesson #33 - Line Oriented Flight Training (LOFT) (2 hours)

A. Objective: The applicant will be able to conduct a crosscountry flight using the airplane's available equipment. During the flight, the instructor will evaluate the applicant's proficiency level in the maneuvers and procedures covered during the course as well as during earlier training (high altitude enroute procedures, etc.). The instructor should identify and correct any maneuvers that may require additional instruction.

B. Content (as applicable):

1. Preflight discussion.
2. Introduction - Flight planning.
   a. Performance limitations (meteorological, weight, and MEL items).
   b. Required fuel loads.

3. Flight.
   a. Preflight planning.
   b. Area departure.
   c. Compliance with manufacturer's recommendations for power settings; airspeeds; rate of climb; configuration.
   d. Adherence to actual or simulated ATC clearances (including assigned radials) and to airspeed restrictions and adjustments required by regulations or the AFM.
   e. Enroute.
      (1) Appropriate use of oxygen and pressurization systems.
      (2) Proper use of available navigation facilities and appropriate enroute procedures.
      (3) Review of maneuvers and procedures from previous lessons, including simulated emergencies.
   f. Area arrival.
      (4) Performance of checklist items appropriate to the area arrival.
      (5) Establishment, where appropriate, of a rate of descent consistent with the aircraft operating characteristics and safety.
      (6) Manually controlled ILS approach with a simulated failure of one powerplant. The simulated failure should occur before initiating the final approach course and continue to touchdown or through the missed approach procedure.*

Notes indicated by an asterisk (*) are instrument procedures that apply only to type ratings that are not restricted to VFR.

4. Postflight critique and preview of practical test.

C. Completion Standards: The type rating applicant should be able to demonstrate competency in performing the maneuvers and procedures required for the practical test to levels consistent with the PTS.

Lesson #34 – Cockpit Resource Management (2 hours)

A. Objective: The applicant will become familiar with Cockpit Resource Management techniques and be able to facilitate the smooth flow of information and application of skills between crewmembers resulting in a safe organized flight.

B. Content:

1. Human physiology.

a. Rest, naps and sleep.
b. Effects of drugs and alcohol.
c. Smoking.
d. Other stresses, e.g., divorce, finance.
e. Eating habits.
f. Stress management.

2. Getting along with others.

a. Hazardous attitudes.
b. Communications skills.

3. Aeronautical decision making.

a. Risk assessment.
b. Risk management.
c. How to develop decision making skills.

4. Company Standard Operating Procedures (SOP).

a. Use of checklists by the crew.
b. Challenge/No response.
c. Pilot flying vs. pilot not flying roles.
d. Abnormal/Emergency procedures.
e. First flight of the day.
f. Critical situations.
g. Deviations from the SOP

C. Completion Standard: This lesson is complete when the trainee is able to demonstrate satisfactory knowledge by a 70 percent score on a written test on the lesson subject matter.

STAGE 5 - FLIGHT INSTRUCTION

Time allocations are suggested only and should be adjusted according to the type rating applicant's ability, the type of airplane and equipment, and the type of operation.

OBJECTWE: The applicant will be able to apply the knowledge and skill acquired during ground training to the airplane.

COMPLETION STANDARDS: The type rating applicant must be able to demonstrate proficiency in handling and operating the airplane by passing the flight portion of the practical test to levels consistent with the PTS.

Lesson #35 - Introduction to the Airplane; Basic Maneuvers (4 hours)

A. Objective: The applicant will become familiar with the airplane and the local training environment and will be able to apply knowledge gained from ground training to operation of the airplane.

B. Content:

Preflight discussion.
Introduction.

1. Airplane documentation - Registration; airworthiness certificate; maintenance logs.
2. Preflight inspection - Complete visual inspection of interior and exterior, using appropriate checklist.

C. Flight:

1. Prestart checklist.
2. Control system checks.
3. Normal starting procedures.
4. Radio and electronic equipment checks.
5. Systems operations familiarization and additional checks described in the approved AFM, checklists, or other approved material appropriate to the airplane type and type of flight.
6. Taxiing.
7. Pretakeoff checks, including powerplant checks as appropriate to the airplane type.
8. Normal or crosswind takeoffs.
9. Airspeed/V-speed control.
10. Straight and level cruise flight.
11. Climbs.

12. Descents.
13. Level, climbing, and descending turns.
14. Steep turns.
15. Approach to stalls.
    a. Takeoff configuration.
    b. Clean configuration.
    c. Landing configuration.
16. Approach to landing and landings.
    a. Appropriate configurations.
    b. Normal or crosswind landings.
17. Engine shutdown procedures.

D. Postflight critique and preview of next lesson.

Completion Standards: At the completion of this lesson, the type rating applicant must be able to demonstrate basic airmanship qualities and understanding of flight characteristics of the aircraft for which the type rating is sought.

Lesson #36 - Proficiency Training (4 hours)

A. Objective: The applicant will gain proficiency in takeoffs, landings, VFR patterns, and will begin instrument work, if applicable. This lesson should further acquaint the type rating applicant with the local training area.

B. Content:

Preflight discussion.
Plight.

1. Review of previous lesson.
2. Practice takeoffs and landings to become comfortable with power settings, airspeeds, and attitudes for flying a VFR pattern.
3. Takeoff with instrument conditions simulated at or before reaching an altitude of 100 feet above the airport elevation.*
4. ILS to missed approach.*
5. ILS approach and landing.*
6. Nonprecision approach to the minimum descent altitude, followed by a change in heading and the necessary visual maneuvering to maintain a flight path that permits a normal landing on a runway at least 90° from the final approach course of the simulated instrument portion of the approach.*

Note: Items indicated by an asterisk (*) are instrument procedures that apply only to type ratings that are not restricted to VFR.

C. Postflight critique and preview of next lesson.

Completion Standards: At the completion of this lesson, the applicant must be able to perform the maneuvers contained in this lesson to PTS and takeoff and land the airplane without assistance from the instructor.

Lesson #37 – Emergency Procedures; Proficiency (4 hours)

A. Objective: The applicant will be able to perform emergency procedures that can be safely simulated in the airplane. Although not all emergencies can be safely simulated in the airplane, those that can should be practiced in accordance with the manufacturer's recommendations.

B. Content (as applicable):

Preflight discussion.
Review of previous lessons.
Introduction – Emergency procedures review.
Plight.

1. Powerplant failure(s).
2. On takeoff roll, before reaching a specified airspeed/V-speed. The rejected takeoff should encompass using the recommended braking procedure; maintaining positive control; and accomplishing the appropriate powerplant failure procedures as recommended by the appropriate checklist.
3. In multiengine airplanes, on climbout with a simulated failure of the most critical powerplant at a point appropriate to the airplane type under the prevailing conditions and in normal cruise flight. The recovery procedures should be as specified in the AFM and will include setting powerplant controls; reducing drag as necessary; correctly identifying and verifying the inoperative powerplant; maintaining positive aircraft control; attempting to determine the reason for the powerplant failure; and following the prescribed aircraft checklist to secure the inoperative engine. When the engine is actually shut down and feathered (if appropriate), the proper powerplant restart procedures should be followed in accordance with the manufacturer's recommended procedures and pertinent checklist items.
4. In single-engine airplanes, establishing and maintaining the recommended best glide airspeed; selecting a suitable airport or landing area that is within the performance capability of the aircraft; following the emergency checklist items appropriate to the aircraft; maintaining positive aircraft control throughout the maneuver; and using airplane configuration devices such as landing gear and wing flaps in a manner recommended by the manufacturer. Landings from a forward slip should be practiced, as should spot simulated emergency landings from 1000 feet above ground level (AGL) with a 180° change of direction.

5. Simulated loss of pressurization – Rapid decompression emergency procedures.
   a. Knowing the location and correct use of oxygen masks.
   b. Rapid descent.

6. Manually controlled ILS approach with a simulated failure of one powerplant. The simulated failure should occur before initiating the final approach course and must continue to touchdown or through the missed approach procedure.*
7. Zero-flap landing to simulate inoperable full or partial flaps, leading edge flaps, and other similar devices.

C. Postflight critique and preview of next lesson.

Completion Standards: At the completion of this lesson, the applicant will be proficient in the manufacturer's recommended emergency procedures for the airplane and will be able to competently demonstrate their execution in a simulated emergency situation.

Lesson #38 – Night Checkout; Review (3 hours)

A. Objective: The applicant will become familiar with night operations in the airplane.

B. Content:

1. Preflight discussion.
2. Review of previous lessons.
3. Introduction – Night flying.

C. Flight:

1. Night line inspection.
2. Use of cockpit and cabin lights.
3. Airplane lights (navigation; strobe; recognition beacon; landing; taxi and logo).
4. Takeoff and landing practice, including a simulated electrical failure.
5. Recovery from unusual attitudes in cruise flight.
6. Multiple instrument approaches.*
7. Review of any areas needing additional work.

D. Postflight critique and preview of practical test.

Completion Standards: The applicant must be able to demonstrate the ability to accurately control all aspects of flying the airplane at night, including night emergency procedures.

Note: Items indicated by an asterisk (*) are instrument procedures that apply only to type ratings that are not restricted to VFR.

PRACTICAL TEST.

OBJECTIVE: The type rating applicant must be able to demonstrate knowledge of operational proficiency in the airplane and its systems during the practical test.

CONTENT:

A. Oral examination.

B. Flight test.
   1. Simulator/training device.
   2. Airplane.

C. Evaluation and critique.

COMPLETION STANDARDS: The type rating applicant will be able to demonstrate the proficiency required to pass the type rating practical test.

APPENDIX 2. PILOT CERTIFICATE AIRCRAFT TYPE DESIGNATIONS

This appendix provides pilot certificate designations adopted by the FAA for aircraft type ratings. It incorporates all revisions to previous listings, including new designations for aircraft type certificated as of February 21, 1991.

The designations in column 4 of appendix 2 have been entered on all pilot certificates issued or reissued with aircraft type ratings since May 1, 1977.

Previously used designations listed in column 3 *of appendix* 2 *will* remain in effect and will not require a reissuance or conversion to the new type rating designations in effect as of February 21, 1991.

PILOT CERTIFICATE AIRCRAFT TYPE DESIGNATIONS--AIRPLANES

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
Aero Commander, Div. North American Rockwell Corp., USA	1121 Jet Commander Westwind	AC-1121 CJ-1123	IA-JET
Aerospatiale, France	SN 601 Corvette		SN 601
Aerospatiale, Aeritalia	ATR-42		ATR-42
Armstrong Whitworth Aircraft, LTD., UK	Argosy AW 650	Armstrong Whitworth AW-650	AW-650
Beech Aircraft Corp., USA	BE-300/1900		BE-300, BE-1900
	200T/200TC (Restricted)		BE-200
	BE-2000 Starship		BE-2000
	BE-2000		
(Formerly Mitsubishi Aircraft International, Inc.)	Diamond I and MU-300-10	MU-300	MU-300, BE-400
Boeing Co., USA	B-17	Boeing B-17	B-17
	247-D	Boeing 247	B-247
	314	Boeing 314	B-314
	S-307, SA-307	Boeing 307	B-307
	377, C-97, YC-97	Boeing 377	B-377
	707, 720, C-135, E3-A	Boeing 707/720	B-707, B-720
	727	Boeing 727	B-727
	737/100/200/300	Boeing 737	B-737
	T-43		
	747, 747SP, E-4	Boeing 747	B-747
	B-747-400		B-747-4
	757, 767	Boeing 757, 767	B-757, B-767

PILOT CERTIFICATE AIRCRAFT TYPE DESIGNATIONS--AIRPLANES CONTINUED

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
Breguet, France	Fauvette 905A		BG 905
Bristol Aircraft LTD., UK	Britannia 305		BR-305
British' Aerospace Aircraft Group Hatfield Chester Div. Hatfield-Hertfordshire, England	BAE-146, 100/300 Series 100/300 Series		BAE-146
	BAE-ATP		BAE-ATP
British Aerospace Aircraft Group Scottish Div. Ayrshire, Scotland KA92RW	HP.137, MK.1 Jetstream Series 200 Jetstream 3101 Jetstream 3201		BA-3100
British Aircraft Corp., UK	BAC 1-11	BAC-1-11	BA-111
B/A Concorde	Concorde SST		CONCRD
Bushmaster Aircraft	Bushmaster 2000		BU-2000
Canadair, LTD. Canada	CL-44, OC-6 CL-215 IA10 (Challenger) CL-600 (Challenger) CL-601, CL-601A	Canadair	CL-44 CL-600
Cessna Aircraft Corp., USA	Cessna 500 Series, T-47 Citation III, Model 650		CE-500 CE-650
Chase (also Roberts Aircraft Co.), USA	YC-122	Chase YC-122	YC-122

PILOT CERTIFICATE AIRCRAFT TYPE DESIGNATIONS--AIRPLANES CONTINUED

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
Consolidated - Vultee Aircraft	(See General Dynamics Corp.)		
Convair	(See General Dynamics Corp.)		
Constructiones Aeronauticas S.A.	CASA (Model) C-212-CB C-235		CA-212 CN235
Curtiss-Wright Corp., USA	Commando CW-20	Curtiss-Wright C-46	CW-46
Dart Aircraft Corp.	(See General Dynamics Corp.)		
Dassault, General Aeronautique Marcel, Dassault, France	Mystere 20 Falcon, Fan Jet Mystere 10 Falcon, Fan Jet Model 200	GAMD/SUD-20	DA-20 DA-10 DA-200
Dassault, General Aeronautique Marcel, Dassault France		Falcon 50 (Tri-jet) Falcon 900	DA-50
deHavilland Aircraft of Canada LTD., Canada (See Hawker Siddeley	Caribou 4A, USAF C-7A, Army CV-2 DHC-7 DHC-8	deHavilland Caribou DH-4	DH-4 DHC-7 DHC-8
Dee Howard Co., USA	Howard 500	Howard 500	Hw-500
Dornier GMBH Friedrickshafen, Germany	Dornier 228-201/101		DO-228

PILOT CERTIFICATE AIRCRAFT TYPE DESIGNATIONS--AIRPLANES CONTINUED

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
Douglas Aircraft Co.	(See McDonnell Douglas)		
Empresa Brasileira de Aeronautica, Brazil	EMB-110P1, P2, P3 EMB-120		EMB-110 EMB-120
Fairchild Aircraft Corp., USA and	Friendship F-27 F-227 C-119C C-123	Fairchild F-27/227	F-27 FA-119C FA-C123
Fairchild Hiller	C-82A		C-82A
Fokker, Netherlands	Fellowship F-28 (Models 1000 & 4000) Fokker 28 Mk 0100 F-50		FK-28 FK-100 F-50
Ford Motor Corp., USA	Tri-Motor 4-AT 5-AT, FO-5	Ford 5	FO-5
Gates Learjet Corp., USA	23,24,25,28,29,31, 35,36,55,C21-A	LR-23, LR-24, LR-JET, LR-25, LR-28, LR-29, LR-35 LR-36, LR-50	LR-JET
General Dynamics Corp., USA	PB2Y, PB2Y-5	Consolidated-Vultee PB2Y	CV-PB2Y
General Dynamics Corp., USA	PB4Y-2,QP-4B	Consolidated-Vultee P4Y	CV-P4Y
	PBY-5,28-4,28-5	Consolidated-Vultee PBY-5	CV-PBY-5
	LB-30,C-87A,RB-24	Consolidated-Vultee LB-30	CV-LB30
	240,340,440,	Convair 240/	CV-240

PILOT CERTIFICATE AIRCRAFT TYPE DESIGNATIONS--AIRPLANES CONTINUED

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
	T-29, C-131	340/440	CV-340 CV-440
	22,22M (880) (990)	Convair 880/990	CV-880, CV-990
Napier-Eland	Napier-Eland Convair Mark I, Mark II Allison Propjet	Mark I/II	CV-N1, CV-N2
	Convair 340,440,580	Allison 340/440	CVA340
	Dart Convair 240, 340, 440	Convair 600/ 640	CV-600, CV-640
Groupement d'Interet Economique Airbus Industrie, France	A300B Airbus		A-300
	A-300-600		A-310
	A-310 Airbus		
	A-320		A-320
Grumman Aircraft Engineering Corp., USA	TBF, TBM, AF-2S (ref. T.O. AR-36)	Grumman TBF	G-TBM
	G-64 Albatross		G-111
	G-73 Turbo Mallard (Frakes Conversion)	FS-73T	G-73T
	G-73 Mallard	Grumman G-73	G-73
	S2F/C1A		G-S2
	G-159 Gulfstream VC-4A, TC-4C	Grumman G-159	G-159

PILOT CERTIFICATE AIRCRAFT TYPE DESIGNATIONS-AIRPLANES CONTINUED

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
Grumman Aircraft Engineering Corp., USA	G-1159 Gulfstream G-1159 C	Grumman G-1159	G-1159 G-IV
Hamburger Flug-Zeugbau, G.M.B.H., West Germany	Hansa Jet 320		HF-320
Handley Page Aircraft Co., Ltd., UK	Herald 300	Handley Page 300	HP-300
Hawker, Siddeley Aviation Ltd., UK	DH-125	Hawker Siddeley	HS-125
	DH-106, Comet 4C	deHavilland 4C	HS-106
	DH-114 Heron	Hawker Siddeley	HS-114
	Hawker Siddeley 748		HS-748
Howard Aero Corp.	(See Dee Howard Co.)		
Israel Aircraft Ltd., Israel	Commodore Jet 1123 CJ-1123	AC-1121	IA-JET
	Westwind 1124 (See Aero Commander)		
	IAI-1125		IA-1125
	ARAVA IA 101B		IA-101
Lockheed Aircraft Corp., USA	Lighting P-38	Lockheed P-38	L-P38
	B-34, PV-1, PV-2	Lockheed B-34	L-B34

PILOT CERTIFICATE AIRCRAFT TYPE DESIGNATIONS-AIRPLANES CONTINUED

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
	Series 14	Lockheed 14	L-14
	18, C-57, C-60, R-50, Learstar	Lockheed 18	L-18
	P2V-7 (Restricted)		L-P2V
Lockheed Aircraft Corp.,	Constellation 049, 149, 649, 749, 1049, 1649	Lockheed Constellation	L-1049
	Electra 188, P-3	Lockheed 188	L-188
	Jetstar 1329, C-140	Lockheed 1329	L-1329
	Jetstar 11, 1329-25		
	382, C-130	Lockheed 382	L-382
	300, C-141	Lockheed 300	L-300
	L-1011 Tristar		L-1011
	T-33		T-33
Martin-Marietta Corp., USA	B-26 Marauder	Martin B-26C	M-B26
	PBM-5, C-162	Martin PBM-5	M-PBM-5
	Mariner/202, 404	Martin 202/404	M-202, M-404
McDonnell Douglas Aircraft Corp., USA	AD-4N		AD-4N
	A-20	Douglas A-20	DC-A20
	A-24, SBD	Douglas A-24	DC-A24
	B-26	Douglas B-26	DC-B26
	B-18	Douglas B-18	DC-B18

PILOT CERTIFICATE AIRCRAFT TYPE DESIGNATIONS-AIRPLANES CONTINUED

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
	B-23, UC-67	Douglas B-23	DC-B23
	DC-2, C-32, C-34 C-39, C42	Douglas DC-2	DC-2
	DC-3, C-47, C-117	Douglas DC-3	DC-3
McDonnell Douglas Aircraft Corp., USA	Super DC-3, C-117D DC-3 (Turboprop)	Douglas DC-3S	DC-3S DC-3TP
	DC-4, C-54	Douglas DC-4	DC-4
	DC-6, DC-7, C-118	Douglas DC-6, DC-7	DC-6, DC-7
	DC-8	Douglas DC-8	DC-8
	DC-9, DC-9-50, C-9 DC-9-80, MD-80	Douglas DC-9	DC-9
	DC-IO, KC-10 MD-11		DC-IO MD-l 1
Mitsubishi Aircraft International, Inc.	(See Beech Aircraft)		
Morane-Saulnier, France	MS760	Morane-Saulnier MS-760	MS-760
Nihon Aeroplane Manufacturing Co., LTD., Japan	YS-11	NAMC YS-11	YS-11
Nord Aviation, France	262A Super Broussard, ND 262/ 262 FM, Mohawk 298	Nord 262	ND-262
North American Rockwell Corp., U S A	NA-265 Sabreliner T-39	North American NA-265	N-265
	B-25 Mitchell	North American	N-B25
Northrop Corp., USA	P-61 Black Widow	Northrop P-61	NH-P61

PILOT CERTIFICATE AIRCRAFT TYPE DESIGNATIONS--AIRPLANES CONTINUED

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
Piaggio, Italy	Piaggio-Douglas 808	Piaggio Douglas PD-808	P-808
Piper Aircraft, USA	PA-42-720 (Restricted)		PA-42R
SAAB-Fairchild International S-581 88 Linkoping Sweden	SAAB-Fairchild 340		SF-340
Short Brothers and Harland Ltd., Northern Ireland (UK)	SD3-30, SD3-60 variant 200	SD3-30	SD-3
Sikorsky Aircraft Division of United Aircraft Corp., USA	VS-44A, C-32, C-34	Sikorsky VS-44	SK-44
	S-43 Series	Sikorsky S-43	SK-43
Sud Aviation, France	Se Caravelle I, II, VIR	SUD 210	S-210
Swearingen Fairchild Aircraft, Corp.,	SA 226-TC, SA-227-AC AT, TT		SA-227
Vickers-Armstrong British Aircraft Corp., UK	700 & 800 Series	Vickers Viscount	VC-700, VC-800

PILOT CERTIFICATE AIRCRAFT TYPE DESIGNATIONS--HELICOPTERS

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
Bell USA	BH-214ST		BH-14ST
Boeing Vertol, USA Kawasaki,	107-II, H-46 KV107-II	Vertol 107 II	BV-107
	114, CH-47A Series, BV-234		BV-114 or BV-234
	BV-44, H-21	Vertol 44	BV-44
Sikorsky, USA	H-37 Series	SK-56	
	S-58 Series H-34 Series	Sikorsky S-58 S-58IT	SK-58
	S-61 Series H-3 Series	Sikorsky S-61	SK-61
	S-64 Series CH-54A Series	Sikorsky S-64	SK-64
	HH-53, CH-53A	Sikorsky S-65	SK-65
Sud Aviation, USA	SA321F SA330F, SA-332 AS-330		S-321 S-330

The following is a list of helicopters weighing 12,500 pounds or less on which type ratings are issued to holders of airline transport pilot certificates only:

Aerospatiale, France	SA 341/342 Gazelle		SA-341 SA 360
	AS 350 Astar		AS-350
	SA 355 Twinstar		AS-355
	SA 360C Dauphine (SE)		SA-360
	SA 365 Dauphine (ME)		SA-365

PILOT CERTIFICATE AIRCRAFT TYPE DESIGNATIONS--HELICOPTERS CONTINUED

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
Bell, USA	47 Series H-13 Series	Bell 47	BH-47
	204-B, UHI-B, -D, H205A	Bell 204	BH-204
	206A, 206B	Bell 206	BH-206
	212/412 Series	Bell 212	BH-212
	214 Series	None	BH-214 BH-214 ST
Bell, USA	222 Series 412	None	BH-222 BH-412
Bradley, USA	B-2 (YH03BR) B-305	Brantley B-2 Brantley B-305	BY-2 BY-305
Costruzioni Aeronautiche Giovanni Agusta, Italy	A109 Agusta		A-109
Enstrom, USA	F-28	Enstrom F-28	EN-28

PILOT CERTIFICATE TYPE RATING INFORMATION--HELICOPTERS CONTINUED

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
Hiller, USA	UH-12 Series H-23	Hiller UH-12	HH-12
Fairchild, USA	FH-1100	FH-1100	FA-1100
Hughes, USA	300, 269 Series 500, 369 Series	Hughes 269A Hughes 500	HU-269 HU-369
Kaman, USA	K-190A K-225 K-240, HTK-1 K-600	Kaman K-190A Kaman K-225 Kaman K-240 None	KM-190 KM-225 KM-240 KM-600
Lockheed, USA	Lockheed California 286	Lockheed California 286	L-286
Messerschmitt Bolkow Gmbh (West Germany)	BO-105A		BO-105
	BK-117A1		BK-117
Omega, USA	12D1A	Omega 12D1	OM-12
Piasecki, USA	HRP-1, HRP-2	Piasecki HRP	PI-HRP
Robinson Helicopter	R-22	None	R-22
Sikorsky, USA	R-4B	Sikorsky R-4B	SK-4
Sikorsky, USA	R-5A, YR-6A R-6A, HOS-1	Sikorsky R-5A	SK-5
	S-51	Sikorsky S-51	SK-51
	S-52 Series	Sikorsky S-52	SK-52
	S-55, H-19 Series	Sikorsky S-55	SK-55
	S-62A, HH-52A	Sikorsky S-62	SK-62
	S-76		SK-76

PILOT CERTIFICATE TYPE RATING INFORMATION--HELICOPTERS CONTINUED

1	2	3	4
MANUFACTURER	MODEL DESIGNATION	PRIOR DESIGNATION	PILOT CERTIFICATE CURRENT DESIGNATION
Silvercraft, USA	SPA-SH4		SI-4
Scheutzow, USA	Model B		SC
Sud Aviation	SE 3130, SE 313B SE 3160, SA 316B SA 3180, SA 318B SA 318C, SA 315B	Sud Alouette II/III	S-3130
	SO 1221	Sud Djinn	S-1221
Westland Helicopters, Inc., Yeoville, England	W-30		WH-30

APPENDIX 3. OPERATIONAL RESTRICTIONS

Applicants for type ratings on aircraft for which a type rating is required under FAR Section 61.31, and which are not listed in Appendix 2, will be required to present evidence that at least one aircraft of the type concerned has been issued an aircraft type certificate for civilian use.

NOTE: Since experimental aircraft are not issued type certificates, they are not eligible for pilot type ratings.

The following operational restrictions pertaining to type ratings will appear as limitations rather than as a part of the type rating on certificates:

1. Amphibian type ratings, such as CV-PBY5, will be repeated under limitations (Item XIII) with appropriate restrictions; i.e., CV-PBY5 LIMITED TO SEA, unless proficiency has been demonstrated on both land and water.

2. Type ratings restricted to VFR will be repeated under limitations (Item XIII) with appropriate restrictions; i.e., N-B25, VFR ONLY.

Airplane Multiengine Class Rating Limited To Center Thrust

Airplane multiengine class ratings are issued based on either the successful completion of an FAA practical test or on military qualification. A class rating issued for an airplane for which no minimum control speed has been established by the manufacturer, shall be limited to center thrust. The aircraft listed below are aircraft which are center thrust limited. A listing of specific makes and models of military aircraft for which a center thrust limitation is not required is also provided.

The FAA General Aviation and Commercial Division, AFS-800, determines any modifications to these lists. When a determination is made by AFS-800, the manufacturer's data and FAR Part 23 or Part 25 criteria are used.

With Center Thrust Limitation

1. Cessna 336/337, T-37
2. Fairchild Republic A-10 Thunderbolt
3. General Dynamics F-111
4. Grumman A6-E Intruder
5. McDonnell-Douglas F-4 Phantom
6. Northrop/McDonnell-Douglas F-18A Hornet
7. Northrop T-38 Talon
8. Rockwell International T2 Buckeye

Without Limitation

1. Cessna A-37 Dragonfly
2. Grumman American F-14 Tomcat

In the case of an applicant who requests the issuance of a multiengine class or type rating based on military qualification in an aircraft not listed herein, but for which the manufacturer has not provided documentary evidence of a minimum control speed for that aircraft, all available data shall be forwarded to AFS-800 for review and evaluation to determine the limitations necessary. It is expected that aircraft models will be added to, or deleted from, this list by AFS-800 as circumstances warrant in the future.

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